
Overview

This standard identifies the competencies you need to set up and operate a computer aided design system to produce fully dimensioned simple and complex drawings for patterns, cores, coreboxes or models, in accordance with approved procedures. This will require you to select the appropriate equipment and software to use, based on the type and complexity of the patterns or models being produced. You will be expected to use current British, European and company standards to produce a drawing template for a range of paper sizes that must include the drawing title, scale used, projection, date of drawing, material to be used and other relevant information. You will then be expected to produce fully detailed drawings, such as first and third angle projection, showing front elevation, side elevation, plan view and, where appropriate, sectional elevations. The drawings will be fully dimensioned and clearly show the tolerances to be achieved.

Your responsibilities will require you to comply with organisational policy and procedures for working in the drawing office or Computer Aided Design (CAD) suite. You will be required to report any problems with the CAD hardware, software or drawing procedures that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will be expected to work to verbal/written instructions and draught specifications, with a minimum of supervision, taking personal responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to applying computer aided drawing procedures. You will understand the CAD system and software used, and its application, and will know about the various tools and techniques used to produce the drawings, in adequate depth to provide a sound basis for carrying out the activities to the required specification.

You will understand the safety precautions required when working with the CAD system. You will be required to demonstrate safe working practices throughout, and will understand the responsibility you owe to yourself and others in the workplace.

Performance criteria

You must be able to:

1. prepare the CAD system for operation
2. produce drawings that are sufficiently and clearly detailed
3. produce drawings in the required formats
4. use codes and other references that follow the required conventions
5. make sure that drawings are checked and approved within agreed timescales by authorised people
6. ensure drawings are properly saved and stored securely
7. ensure that changes are completed as required by organisational procedures

Knowledge and understanding

You need to know and understand:

- K1 the specific safety precautions to be taken when working with Computer Aided Drawing (CAD) systems - to include such items as safety guidance relating to the use of visual display unit (VDU) equipment and workstation environment (such as lighting, seating, positioning of equipment); repetitive strain injury (RSI), the dangers of trailing leads and cables; how to spot faulty or dangerous electrical leads, plugs and connections
- K2 good housekeeping arrangements (such as cleaning down work surfaces; putting media, manuals and unwanted items of equipment into safe storage; leaving the work area in a safe and tidy condition)
- K3 the set-up and operation of the CAD system, and the peripheral devices that are used (such as mouse, light pens, digitisers and tablets, printers or plotters, scanners)
- K4 the correct start-up and shutdown procedures to be used for the CAD system
- K5 how to access the specific CAD software to be used; the use of access codes for personal files; how to deal with system problems (such as error messages received, peripherals which do not respond as expected, obvious faults with the equipment or connecting leads)
- K1 the importance of protecting the computer system from viruses, and the implications if the correct procedure is not followed
- K6 the use of software manuals and related documents to aid efficient operation of the CAD system
- K7 types of drawings that may be produced by the software (such as first and third angle drawings, sectional elevations)
- K8 the national, international and organisational standards and conventions that are used for the drawings
- K9 how to set up the drawing template, taking account of the scale of the drawing and the paper size that will be required; how to choose and set up colour, line type, dimension and text styles to suit the pattern or model to be drawn
- K10 how to construct drawings, and the application and use of drawing tools for straight lines, curves and circles; the use of standard library component parts; how to create hatching and shading on drawings; producing layers of drawings; how to add dimensions and text to drawings
- K11 the procedures and methods of importing files, and for editing drawings and text
- K12 the need to ensure that completed drawings are approved, correctly labelled, and stored on a suitable storage medium
- K13 how to determine the document size and check that there is sufficient space to save the drawing in your chosen destination
- K14 the need to create backup copies of the drawings and to file them in a separate and safe location
- K15 how to create hard copies of drawings using printers or plotters, and methods of filing and storing the hard copies for use in production
- K16 how to instigate a drawing change, get it authorised and record the change, date and its approval authorisation
- K17 the extent of your own responsibility, and whom you should report to if you have problems that you cannot resolve when producing the drawings of the patterns or models

Scope/range related to performance criteria

1. Prepare the CAD system for operation by carrying out all of the following:
 - 1.1. check that all the equipment is correctly connected and in a safe, tested and usable working condition (cables undamaged, correctly connected, safely routed)
 - 1.2. power up the equipment and activate the CAD software
 - 1.3. set up the drawing environment to be able to produce the drawing to the appropriate scale
 - 1.4. set the drawing datum at a convenient point
 - 1.5. set up colour, line type, dimension, text styles to company procedures or to suit the drawing produced
 - 1.6. create a standard drawing template to BS, European or company standards, which includes all necessary detail (such as title, drawing number, scale, material, date)
2. Create a drawing environment that uses one of the following:
 - 2.1. object-based properties
 - 2.2. layer-based properties
3. Produce two of the following types of drawings:
 - 3.1. first angle orthographic projections
 - 3.2. third angle orthographic projections
 - 3.3. isometric/oblique projections
4. Produce drawings which include all of the following:
 - 4.1 straight lines
 - 4.2 angled lines
 - 4.3 curved lines
 - 4.4 circles
 - 4.5 ellipses
 - 4.6 dimensions
 - 4.7 text
 - 4.8 insertion of standard components
 - 4.9 hatching or shading
 - 4.10 hidden detail
5. Produce drawings to support the production of three of the following:
 - 5.1 flat-backed patterns with cores
 - 5.2 coreboxes with special features (loose pieces, collapsible)
 - 5.3 irregular joint patterns
 - 5.4 plated patterns (copes)
 - 5.5 scale models
 - 5.6 split patterns without cores
 - 5.7 solid turnout coreboxes
 - 5.8 sectional models
 - 5.9 split patterns with cores
 - 5.10 split coreboxes
 - 5.11 vacuum forming tools

5.12 plated patterns (drags)

5.13 full-size models

5.14 stripping plates

6. Save and store drawings in appropriate locations, to include all of the following:

6.1 ensure your drawing has been checked and approved before storing

6.2 check that the drawing is correctly titled and referenced

6.3 save the drawing to an appropriate storage medium

6.4 create a separate backup copy

6.5 produce a hard copy printout of the drawing for file purposes (where required)

6.6 register and store the drawings in the appropriate company information system

6.7 where appropriate, record and store any changes to the drawings, and reasons for changes in the appropriate company information system

7. Produce drawings which comply with all the following quality and accuracy standards:

7.1 drawing conventions used comply with BS, European and company standards and procedures

7.2 drawings accurately represent the required patterns, coreboxes or models

7.3 drawings are of an appropriate scale, clearly defined, with text and dimensions legible

7.4 drawings are fully dimensioned and toleranced and avoid

Behaviours

You will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as:

- strong work ethic
- positive attitude
- team player
- dependability
- responsibility
- honesty
- integrity
- motivation
- commitment

SEMPAT321

Producing drawings for patterns and models using computer aided techniques



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